

عنوان مقاله:

Molecular cloning and in silico analysis of a GTP cyclohydrolase I gene from grape

محل انتشار:

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خلاصه مقاله:

An entire open reading frame (ORF) encoding for a polypeptide of GTP cyclohydrolase I (GTPCH I) was isolated and cloned from Askari cultivar of grape (*Vitis vinifera* L.) berries. The ۱,۳۳۸-nucleotide ORF yields a ۴۴۵-residue amino acid sequence with a calculated molecular mass of ۴۸.۶۵ kDa and a predicted isoelectric point of ۶.۴۳. The Vvgtpch I genomic sequence with a length of ۴,۹۶۴ bp contains two exons (۱۶۹ and ۱,۱۶۹ bp) and an intron (۲,۶۲۶ bp). The gtpch I sequence of grape displayed a strong similarity with gtpch I sequence found in other plants, including peach (۷۲%), cocoa (۷۲%), strawberry (۷۰%), and poplar (۶۹%). Analysis of mRNA secondary structure revealed that the start codon of Vvgtpch I is completely exposed, suggesting a robust binding of the ribosome and efficient translation. Similar to gtpchs I from diverse sources, molecular modeling uncovered that the monomer of VvGTPCH I adopts an $\alpha\beta$ structure, which includes ۱۰ α -helices and ۸ β -sheets. Moreover, in silico analysis of the Vvgtpch I gene promoter identified potential cis-acting elements responsive to environmental signals. This suggests that the Vvgtpch I gene has the capacity to be responsive to various environmental cues, such as heat, heavy metals, light, and plant hormones.

کلمات کلیدی:

Folate, in silico analysis, Regulatory elements, Cloning, Promoter region

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